

PES-0160

IN THE CLAIMS

1. (Original) An electrochemical cell, comprising:
a first electrode and a second electrode with a membrane disposed therebetween and in ionic communication with the first electrode and the second electrode; and
a sintered porous support member disposed on a side of the membrane opposite the second electrode, wherein the support member comprises a first portion on first side of the support member proximate the membrane and a second portion disposed on a side of the first portion opposite the membrane, wherein the second portion has a second portion porosity different from a first portion porosity.
2. (Original) The electrochemical cell of Claim 1, wherein the second portion porosity is greater than the first portion porosity.
3. (Original) The electrochemical cell of Claim 2, wherein the first portion porosity is less than or equal to about 60%.
4. (Original) The electrochemical cell of Claim 3, wherein the first portion porosity is about 35% to about 50%.
5. (Original) The electrochemical cell of Claim 2, wherein the second portion porosity is greater than or equal to about 50%.
6. (Original) The electrochemical cell of Claim 5, wherein the second portion porosity is about 50% to about 70%.
7. (Original) The electrochemical cell of Claim 1, wherein the support member comprises a third portion disposed on a side of the second portion opposite the first portion, wherein the third portion has a third portion porosity that is less than or equal to the second portion porosity.

PES-0160

8. (Original) The electrochemical cell of Claim 1, wherein the support member comprises a plurality of layers, wherein each layer has a layer porosity of greater than or equal to a previous layer.

9. (Original) The electrochemical cell of Claim 1, wherein the support member is a single layer comprising a decreasing porosity gradient from the first side toward a second side disposed opposite the first side.

10. (Original) The electrochemical cell of Claim 1, wherein the support member further comprises a second side comprising a channel.

11. (Original) The electrochemical cell of Claim 10, wherein the channel extends from an inlet disposed proximate an edge of the side to a terminus disposed proximate a geometric center of the side.

12. (Original) The electrochemical cell of Claim 10, wherein the channel extends from an inlet disposed proximate an edge of the side to an outlet disposed proximate the same or a different edge of the side.

13. (Original) The electrochemical cell of Claim 1, wherein the second portion comprises higher porosity regions and lower porosity regions.

14. (Original) The electrochemical cell of Claim 1, further comprising a pressure pad disposed in physical and electrical communication with the support member.

15. (Original) The electrochemical cell of Claim 1, further comprising an additional sintered porous support member disposed on a side of the membrane opposite the support member.

16. (Original) The electrochemical cell of Claim 15, wherein the additional support member comprises the second electrode.

PES-0160

17. (Original) The electrochemical cell of Claim 15, wherein the additional support member further comprises a first additional portion on first side of the additional support member proximate the membrane and a second additional portion disposed on a side of the first additional portion opposite the membrane, wherein the second additional portion has a second additional portion porosity different from a first additional portion porosity.

18. (Original) The electrochemical cell of Claim 17, wherein the second additional portion porosity is greater than the first additional portion porosity.

19. (Original) The electrochemical cell of Claim 1, wherein the support member further comprises the first electrode.

20. (Original) An electrochemical cell, comprising:
a first electrode and a second electrode with a membrane disposed therebetween and in ionic communication with the first electrode and the second electrode;
a flow field consisting essentially of a sintered porous support member disposed in electrical and physical communication with the first electrode; and
a pressure assembly disposed in physical and electrical communication with the flow field.

21. (Original) The electrochemical cell of Claim 20, wherein the support member further comprises a first portion adjacent the membrane and a second portion on a side of the first portion opposite the membrane, and wherein the second portion has a second portion porosity different from a first portion porosity.

22. (Original) The electrochemical cell of Claim 20, wherein the second portion porosity is greater than the first portion porosity.

23. (Original) The electrochemical cell of Claim 20, wherein the support member further comprises the first electrode.

PES-0160

24. (Original) The electrochemical cell of Claim 20, wherein the support member is configured to support the membrane at pressures of greater than or equal to about 100 psi.

25. (Original) The electrochemical cell of Claim 24, wherein the pressures are greater than or equal to 500 psi.

26. (Original) The electrochemical cell of Claim 20, wherein the porous support member comprises a channel.

27. (Original) The electrochemical cell of Claim 20, wherein the pressure pad assembly is a pressure pad.

28 – 29. (Cancelled)

30. (New) The electrochemical cell of Claim 1, wherein the channel is disposed between the first portion and the second portion.

31. (New) The electrochemical cell of Claim 1, wherein the first portion is a first layer and the second portion is a second layer.

32. (New) The electrochemical cell of Claim 21, wherein the first portion is a first layer and the second portion is a second layer.